(54) [Title of the Invention] PRINTER APPARATUS

(57) [Abstract]

[Purpose] The present invention relates to a printer apparatus, and to the printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network. An object of the present invention is to provide a printer apparatus which eliminates wasteful use of paper by limiting the number of available sheets of recording paper and can prevent an unspecified large number of people from illegally using the printer.

[Construction] A network controller 1 receives the number of print-request sheets for printing on recording paper from

the other person's workstation. At the same time, the
internal RAM of a printer controller 3 stores the number of
use-limit sheets which limits the number of use sheets and
the number of used sheets of recording paper which has
already been printed. Here, the printer controller 3 adds
the number of print-request sheets and the number of used
sheets, and then compares the number of use-limit sheets
with the addition result. As a result of the comparison, if
the number of use-limit sheets is smaller, the printer
controller 3 controls to stop printing of the print data on
the recording paper.

[Claims]

[Claim 1] A printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the printer apparatus comprising: network control means which receives the number of print-request sheets to be printed on the recording paper from the other person's workstation; control data storage means which stores the number of use-limit sheets for limiting the number of use sheets of the recording paper and the number of used sheets of the recording paper already printed; comparison means which adds the number of print-request sheets and the number of used sheets, and then compares the number of use-limit sheets with the addition result; and printer control means which controls to stop printing of the print data on the recording paper if the number of use-limit sheets is smaller as a result of the comparison by the comparison means.

[Claim 2] A printer apparatus according to Claim 1, wherein the printer control means controls to give a use right for printing the print data on the recording paper if the number of use-limit sheets is greater as a result of the comparison by the comparison means.

[Claim 3] A printer apparatus according to Claim 1, further comprising: counting means for counting the number of print sheets to be printed on the recording paper if the number of

use-limit sheets is greater as a result of the comparison by the comparison means; and data addition means for adding a counting result counted by the counting means to the number of used sheets stored in the control data storage means.

[Claim 4] A printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the printer apparatus comprising: network control means which receives at least one of a user name and a network address from the other person's workstation; control data storage means which stores the user name and the network address received by the network control means; and printer control means which controls to give a use right for printing the print data on the recording paper if at least one of the user name and the network address newly received by the network control means matches one stored in the control data storage means.

[Claim 5] A printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the printer apparatus comprising: network control means which receives the number of use-limit sheets corresponding to at least one of a user name and a network address from the other person's workstation; and control data storage means which stores, as an initial setting value, the number of use-limit sheets corresponding to at least one of the user name and the network address received by the

network control means.

[Detailed Description of the Invention]

[0001]

[Field of Industrial Application] The present invention relates to a printer apparatus, and more particularly, to a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, wherein a user name, a network address, and the number of use-limit sheets are set, and the number of use sheets of the recording paper can be limited, and an illegal use of the printer by an unspecified large number of people can be prevented.

[0002]

[Description of the Related Arts] Up to now, regarding a printer apparatus, a "network system" disclosed in Japanese Patent Laid-Open No. 4-207540 has been reported. In this apparatus, in a print job, to which a recipient name is added and which has been input through a network, first, control means provided in the print controller checks whether or not the recipient name is stored in storage means. If the recipient name is registered, information indicating the bin registered in the storage means corresponding to the recipient name is read, and a printer, which is provided with a sorter so as to output a storage medium to the bin, is controlled. Thus, the printer apparatus has an advantage

in that the output documents corresponding to the print jobs are output from the printer by having been sorted.

[0003]

[Problems to be Solved by the Invention] However, in a known printer apparatus, since the number of available sheets of recording paper is not limited, a specific user might use the printer without limitation. In particular, in a printer which is widely connected to a large number of user terminals through a network, there has been a problem in that this tendency is remarkable, and consumables such as recording paper and the like are wasted.

[0004] Accordingly, an object of the present invention is to provide a printer apparatus, which prints, on recording paper, print data sent from the other person's workstation through a network, wherein a user name, a network address, and the number of use-limit sheets are set, and the use state of the printer is summarized and controlled for each user, thus the number of available sheets of the recording paper is limited in order to eliminate wasteful use of the paper. At the same time, in the printer apparatus, by limiting the users who can operate by registering the user names, illegal use of the printer by an unspecified large number of people can be prevented.

[0005]

[Means for Solving the Problems] In order to solve the

above-described problems, an invention according to Claim 1
is a printer apparatus which prints, on recording paper,
print data sent from the other person's workstation through
a network, the printer apparatus including: network control
means which receives the number of print-request sheets to
be printed on the recording paper from the other person's
workstation; control data storage means which stores the
number of use-limit sheets for limiting the number of use
sheets of the recording paper and the number of used sheets
of the recording paper already printed; comparison means
which adds the number of print-request sheets and the number
of used sheets, and then compares the number of use-limit
sheets with the addition result; and printer control means
which controls to stop printing of the print data on the
recording paper if the number of use-limit sheets is smaller
as a result of the comparison by the comparison means.

[0006] In order to solve the above-described problems, an
invention according to Claim 2 is a printer apparatus which
includes the printer control means for controlling to give a
use right for printing the print data on the recording paper
if the number of use-limit sheets is greater as a result of
the comparison by the comparison means. In order to solve
the above-described problems, an invention according to
Claim 3 further includes: counting means for counting the
number of print sheets to be printed on the recording paper

if the number of use-limit sheets is greater as a result of the comparison by the comparison means; and data addition means for adding a counting result counted by the counting means to the number of used sheets stored in the control data storage means.

[0007] In order to solve the above-described problems, an invention according to Claim 4 is a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the printer apparatus including: network control means which receives at least one of a user name and a network address from the other person's workstation; control data storage means which stores the user name and the network address received by the network control means; and printer control means which controls to give a use right for printing the print data on the recording paper if at least one of the user name and the network address newly received by the network control means matches one stored in the control data storage means.

[0008] In order to solve the above-described problems, an invention according to Claim 5 is a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the printer apparatus including: network control means which receives the number of use-limit sheets corresponding to at least one of a user name and a network address from the other person's

workstation; and control data storage means which stores, as an initial setting value, the number of use-limit sheets corresponding to at least one of the user name and the network address received by the network control means.

[0009]

[Operation] In the invention according to Claim 1, in the printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the network control means receives the number of print-request sheets for printing on the recording paper from the other person's workstation. At the same time, the control data storage means stores the number of use-limit sheets for limiting the number of use sheets of the recording paper and the number of used sheets of the recording paper already printed. Here, the comparison means adds the number of print-request sheets and the number of used sheets, and then compares the number of use-limit sheets with the addition result. As a result of the comparison by the comparison means, if the number of use-limit sheets is smaller, the printer control means controls to stop printing of the print data on the recording paper.

[0010] Accordingly, the number of use-limit sheets is set from the other person's workstation, and the printer use state is summarized and controlled for each user as the number of used sheets. Therefore, when it is expected that

the printing is performed over the number of use-limit sheets, it is possible to control to stop the printing of the print data on the recording paper. Thus the number of available sheets of recording paper is limited, and wasteful use of the paper can be eliminated.

[0011] In the invention according to Claim 2, in addition to the operation according to Claim 1, the printer control means controls to give a use right for printing the print data on the recording paper if the number of use-limit sheets is greater as a result of the comparison by the comparison means. Accordingly, it is possible to give the user the use right of the printer when it is expected that the printing can be performed without exceeding the number of use-limit sheets set from the other person's workstation.

[0012] In the invention according to Claim 3, in addition to the operation according to Claim 1, if the number of use-limit sheets is greater as a result of the comparison by the comparison means, the counting means counts the number of print sheets for printing the print data on the recording paper, and the data addition means adds this counting result to the number of used sheets stored in the control data storage means and stores this. Accordingly, the number of used sheets can be updated, the number of available sheets of the recording paper is limited based on the latest data at the next use time, and thus wasteful use can be

eliminated.

[0013]   In the invention according to Claim 4, in a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, network control means receives at least one of a user name and a network address from the other person's workstation, and stores the received user name and the network address in the control data storage means. Here, the printer control means controls to give a use right for printing print data on the recording paper if at least one of the user name and the network address newly received by the network control means matches one stored in the control data storage means.

[0014]   Accordingly, by registering the user name and the network address from the other person's workstation and limiting the users who can operate and the network address, it is possible to prevent an unspecified large number of people from illegally using the printer. In the invention according to Claim 5, in a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the network control means receives the number of use-limit sheets corresponding to at least one of a user name and a network address from the other person's workstation, and stores the number of use-limit sheets corresponding to at least one of the received user name and the network address as an initial setting

value into the control data storage means.

[0015] Accordingly, the initial setting of the number of use-limit sheets can be easily performed corresponding to the user name and the network address from the other person's workstation. Therefore by limiting the number of sheets of available sheets of the recording paper is limited for each user or network address, wasteful use is eliminated. Also, by registering the user names and limiting the users who can operate, it is possible to prevent an unspecified large number of people from illegally using the printer.

[0016]

[Embodiments] In the following, a description will be given of an embodiment of the present invention with reference to the drawings. First, a description will be given of the system configuration of a printer apparatus. Fig. 1 is a diagram illustrating that a printer apparatus according to an embodiment of the present invention (claims 1 to 5) is connected to a network.

[0017] As shown in Fig. 1, workstations 100 and 101 and printer apparatus 200 are connected through a network. The workstations 100 and 101 have a CRT display unit and a keyboard, and can select and execute a plurality of software processes by an intelligent function. Also, the workstations 100 and 101 issue a print request to the printer apparatus 200 through the network, and a message

sent from the printer apparatus 200 can be confirmed on the CRT display unit.

[0018] The printer apparatus 200 has a printer function, and outputs the printing of the print data sent from the workstations 100 and 101. Fig. 2 is a system configuration diagram of the printer apparatus according to an embodiment of the present invention (claims 1 to 5). As shown in Fig. 2, the printer apparatus 200 includes a network controller 1, a data storage part 2, a printer controller 3, and a printer mechanism 4.

[0019] The network controller 1 is connected to a physical transmission medium such as a coaxial cable, an optical cable, or the like, has an interface for transmitting and receiving data through a network, and performs frame generation for transmitting and receiving data such as control data, print data, or the like, the transmission and the receiving of the frames, an error check of the received frames and the like. The data storage part 2 has a buffer memory, stores the print data received by the network controller 1, and transmits the print data to the printer mechanism 4.

[0020] The printer controller 3 generates control signals for controlling the printer part 4 based on the control data received by the network controller 1, and determines the use right of the printer mechanism 4 based on the access control

data. Also, the printer controller 3 has an internal RAM, and stores the access control data. The printer mechanism 4 physically prints the print data on the recording paper based on the control signals output from the printer controller 3.

[0021] Fig. 3 is a diagram illustrating the access control data controlled by the printer controller 3 of the printer apparatus according to an embodiment of the present invention (claims 1 to 5). As shown in Fig. 3, the access control data includes a user name, a network address, the number of use-limit sheets, and the number of used sheets. At the workstations 100 and 101, a user inputs a user name, a network address, and the number of use-limit sheets from the keyboard, and the network controller 1 of the printer apparatus 200 receives these through the network. Next, the received user name, network address, and the number of use-limit sheets are controlled by the printer controller 3.

[0022] Here, the user name is the name of the user who transmits print data to the printer apparatus 200 through the network. The network address is the address of the workstation connected to the network. The number of use-limit sheets is the number of sheets of the recording paper allowed to be printed at the printer apparatus 200 for the user. The number of used sheets is the sum value of the number of used sheets of the recording paper used by the

user, and is reset at the time of the initialization setting.

[0023]   The printer controller 3 determines the control data sent from the workstation to the printer apparatus 200 through the network, and determines the use right representing whether or not printing is allowed to the printer apparatus 200.   Fig. 4 is a use-rejection record table controlled by the printer controller 3 of the printer apparatus according to an embodiment of the present invention.

[0024]   As shown in Fig. 4, the use-rejection record table includes a date, a job number, a user name and the use-rejection reason thereof, a network address and the use-rejection reason thereof, the number of print-request sheets, the number of used sheets, and the number of use-limit sheets.   The date is a date when use-rejection processing is performed by the printer controller 3.   The job number is the number corresponding to the print request when the printer controller 3 performed the use-rejection processing. The user name and the use-rejection reason thereof mainly indicate that the user name is unregistered.   The network address and the use-rejection reason thereof mainly indicate that the network address is unregistered.   The number of print-request sheets, the number of used sheets, and the number of use-limit sheets are shown when the added value of the number of print-request sheets and the number of used

sheets is over the number of use-limit sheets.

[0025] Fig. 5 is a flowchart illustrating the print operation of the printer apparatus according to an embodiment of the present invention (claims 1 to 5). First, when a connection request is made from the other person's workstation 100 to the network controller 1 of the printer apparatus 200 through the network, the network controller 1 performs connection processing, receives the user name and the network address from the other person's workstation 100, and stores them into the internal RAM of the printer controller 3 (processing S1). Next, the printer controller 3 determines whether or not the initial setting of the access control data has been completed based on the received user name and network address (processing S2).

[0026] In processing S2, if the initial setting of the access control data has been completed, a determination is made of whether or not the network controller 1 has received a print request from the other person's workstation 100 (processing S3). In processing S3, if a print request has been received, whether there is the use right is checked by checking that the user name or the network address is registered in the access control data stored in the internal RAM of the printer controller 3 based on the user name or the network address received together with the print request (processing S4). Next, a determination is made of whether

or not the received print request has the use right (processing S5).

[0027] In processing S5, if the received print request has a use right, the sum value of the number of print-request sheets, which has been received, and the number of used sheets is subtracted from the number of use-limit sheets corresponding to the user name of the access control data stored in the internal RAM in the printer controller 3, and whether or not the print request has a use right is checked (processing S6). Here, the number of available sheets N of the recording paper which can be expected after the end of the print is:

N = the number of use-limit sheets - (the number of print-request sheets + the number of used sheets) . . . (1)

Next, a determination is made of whether or not the received print request has the use right based on the sign of the comparison expression (1) (processing S7).

[0028] In processing S7, if the comparison expression (1) results in N > 0, thus the received print request has the use right, the print data received by the network controller 1 is stored in the buffer memory of the data storage part 2; the print data is sent to the printer mechanism 4 in sequence, and the print output processing is performed (processing S8). In this regard, in processing S8, the number of used sheets of the recording paper is counted in

order to summarize the use state for each user, and the
number of used sheets is added to the number of used sheets
stored in the access control data, and then the result is
stored.

[0029] On the other hand, in processing S2, if the initial
setting of the access control data has not been completed, a
determination is made of whether or not the network
controller 1 has received the initial setting request from
the other person's workstation 100 (processing S9). In
processing S9, if the initial setting request of the access
control data has been received, the network controller 1
receives the number of use-limit sheets corresponding to the
user name or the network address from the other person's
workstation 100. Also, the access data is stored in the
internal RAM of the printer controller 3, the use right is
set, and the number of used sheets is reset (processing S10).

[0030] On the other hand, if a print request has not been
received in processing S3, or if the initial setting request
of the access control data has not been received in
processing S9, control information other than the print
request or the initial setting request of the access control
data has been received, and thus error processing for
handling as an error is performed (processing S11). On the
other hand, if the received print request does not have the
use right in processing S5, or if the comparison expression

(1) results in N < 0 in processing S7, thus the received print request does not have the use right, the use-rejection reason corresponding to the job number is stored in the use-rejection record table controlled by the printer controller 3 as shown in Fig. 4, and the network controller 1 returns a use-rejection message to the other person's workstation 100 of the print request source. The use-rejection message is for example, "The user name is not registered", "The network address is not registered", or "The number of use-limit sheets is exceeded" (processing S12).

[0031] As described above, in this embodiment (Claim 1), in the printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, the network controller 1 receives the number of print-request sheets for printing on the recording paper from the other person's workstation. At the same time, the internal RAM of the printer controller 3 stores the number of use-limit sheets for limiting the number of use sheets of the recording paper and the number of used sheets of the recording paper already printed. Here, the printer controller 3 adds the number of print-request sheets and the number of used sheets, and then compares the number of use-limit sheets with the addition result. As a result of the comparison by the printer controller 3, if the number of use-limit sheets is smaller, the printer controller 3

controls to stop the printing of the print data on the recording paper.

[0032] Accordingly, the number of use-limit sheets is set from the other person's workstation, and the printer use state is summarized and controlled for each user as the number of used sheets. Therefore, when it is expected that the printing is performed over the number of use-limit sheets, it is possible to control to stop the printing of the print data on the recording paper. Thus the number of available sheets of the recording paper is limited, and wasteful use of the paper can be eliminated. In particular, when using recording paper having a high unit cost for printing, such as a color printer or the like, the effect is high.

[0033] As described above, in this embodiment (Claim 2), the printer controller 3 controls to give the use right for printing the print data on the recording paper if the number of use-limit sheets is greater as a result of the comparison by the printer controller 3. Accordingly, it is possible to give the user the use right of the printer when it is expected that the printing can be performed without exceeding the number of use-limit sheets set from the other person's workstation.

[0034] As described above, in this embodiment (Claim 3), if the number of use-limit sheets is greater as a result of the

comparison by the printer controller 3, the printer controller 3 counts the number of print sheets for printing the print data on the recording paper, and the printer controller 3 adds this counting result to the number of used sheets stored in the internal RAM of the printer controller 3, and stores the result into the internal RAM of the printer controller 3 again.

[0035] Accordingly, the number of used sheets can be updated, the number of available sheets of the recording paper is limited at the next use time based on the latest data, and thus wasteful use can be eliminated. As described above, in this embodiment (Claim 4), in a printer apparatus which prints, on recording paper, print data sent from the other person's workstation through a network, network controller 1 receives at least one of a user name and a network address from the other person's workstation, and stores the received user name and network address in the internal RAM of the printer controller 3. Here, the printer controller 3 controls to give the use right for printing the print data on the recording paper if at least one of the user name and the network address newly received by the network controller 1 matches one stored in the internal RAM of the printer controller 3.

[0036] Accordingly, by registering the user name and the network address from the other person's workstation and

limiting the users who can operate and the network address,
it is possible to prevent an unspecified large number of
people from illegally using the printer. As described above,
in this embodiment (Claim 5), in a printer apparatus which
prints, on recording paper, print data sent from the other
person's workstation through a network, the network
controller 1 receives the number of use-limit sheets
corresponding to at least one of a user name and a network
address from the other person's workstation, and stores the
number of use-limit sheets corresponding to at least one of
the received user name and the network address as the
initial setting value into the internal RAM of the printer
controller 3.

[0037] Accordingly, the initial setting of the number of
use-limit sheets can be easily performed corresponding to
the user name and the network address from the other
person's workstation. Therefore by limiting the number of
available sheets of the recording paper is limited for each
user or network address, wasteful use is eliminated. Also,
by registering the user names and limiting the users who can
operate, it is possible to prevent an unspecified large
number of people from illegally using the printer.

[0038]

[Advantages] According to the present invention, in a
printer apparatus, which prints, on recording paper, print

data sent from the other person's workstation through a network, a user name, a network address, and the number of use-limit sheets are set, and a use state of the printer is summarized and controlled, thus the number of available sheets of the recording paper is limited in order to eliminate wasteful use of the paper. Also, by registering the user names and limiting the users who can operate, it is possible to prevent an unspecified large number of people from illegally using the printer.

[Brief Description of the Drawings]

[Fig. 1] Fig. 1 is a diagram illustrating that a printer apparatus according to an embodiment of the present invention (claims 1 to 5) is connected to a network.

[Fig. 2] Fig. 2 is a system configuration diagram of the printer apparatus according to an embodiment of the present invention (claims 1 to 5).

[Fig. 3] Fig. 3 is a diagram illustrating access control data controlled by a printer controller 3 of the printer apparatus according to an embodiment of the present invention (claims 1 to 5).

[Fig. 4] Fig. 4 is a use-rejection record table controlled by a printer controller 3 of the printer apparatus according to an embodiment of the present invention.

[Fig. 5] Fig. 5 is a flowchart illustrating the print operation of the printer apparatus according to an

embodiment of the present invention (claims 1 to 5).

[Reference Numerals]

1:   network controller (network control means)

2:   data storage part

3:   printer controller (control data storage means, comparison means, printer control means, counting means, data addition means)

4:   printer mechanism

100, 101:   workstations

200:   printer apparatus

[Fig. 1]

NETWORK

100　WORKSTATION

101　WORKSTATION

200　PRINTER APPARATUS

[Fig. 2]

NETWORK

1　　NETWORK CONTROLLER

2　　DATA STORAGE PART

3　　PRINTER CONTROLLER

4　　PRINTER MECHANISM

[Fig. 3]

USER NAME

NETWORK ADDRESS

THE NUMBER OF USE-LIMIT SHEETS

THE NUMBER OF USED SHEETS

TARO

HANAKO

NAOKO

HIKARU

[Fig. 4]

DATE

JOB NUMBER

USER NAME

USER NAME

HOSHI

HANAGATA

TARO

USE-REJECTION REASON

UNREGISTERED

NETWORK ADDRESS

NETWORK ADDRESS.

USE-REJECTION REASON

UNREGISTERED

THE NUMBER OF PRINT-REQUEST SHEETS

THE NUMBER OF PRINT-REQUEST SHEETS

THE NUMBER OF USED SHEETS

THE NUMBER OF USE-LIMIT SHEETS

[Fig. 5]

START

S1   NETWORK CONNECTION PROCESSING

S2   HAS INITIAL SETTING OF ACCESS CONTROL DATA COMPLETED?

S3   PRINT REQUEST?

S4   CHECK USE RIGHT BASED ON USER NAME, AND NETWORK ADDRESS

S5   IS THERE USE RIGHT?

S6   CHECK USE RIGHT BASED ON THE NUMBER OF USE-LIMIT SHEETS
CORRESPONDING TO USER NAME

S7   IS THERE USE RIGHT?

S8   RECEIVE PRINT DATA AND PERFORM PRINT-OUTPUT PROCESSING

S9   IS IT AN INITIAL SETTING REQUEST OF ACCESS CONTROL

DATA?

S10 RECEIVE ACCESS CONTROL DATA, AND SET USE RIGHT

S11 ERROR PROCESSING

S12 PRINTER USE REJECTION PROCESSING

END